# Appendix M

## Watercourse 5 Natural Channel Enhancements

# Fruitland-Winona Block 1 Block Servicing Strategy
# Watercourse 5 Natural Channel Enhancements

Presented By: AC III Group Inc., Urbantech Consulting, GEO Morhix Ltd., and Colville Consulting Inc.

# Existing Conditions – Watercourse 5

Channel conditions at north end of the study area. Debris present throughout the reach.

Channel conditions immediately south of culvert and access laneway at 248 Fruitland Rd.

Example of channel and bank conditions for Watercourse 5.

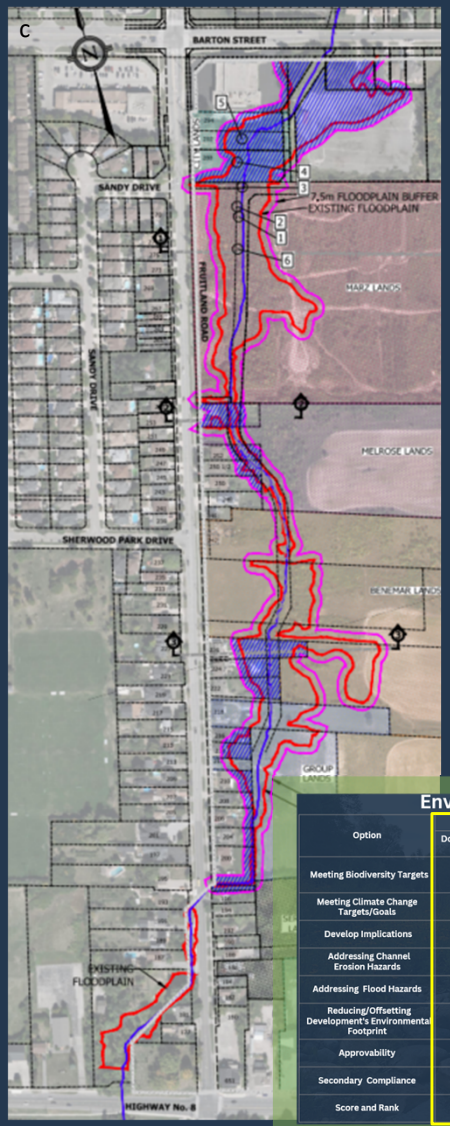
Channel conditions of Watercourse 5 before crossing 252 Fruitland Rd.

Channel conditions and debris present east of 230 Fruitland Rd.

Channel conditions and debris north of culvert and access laneway at 212 Fruitland Rd.

# Environmental Assessment Table

| Option | 1 | 2 | 3 |
|---|---|---|---|
| | Do nothing, leave watercourse and floodplain in place | Improve the watercourse in existing location | Channel Realignment |
| Meeting Biodiversity Targets | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Meeting Climate Change Targets/Goals | ✓ | ✓✓ | ✓✓✓✓ |
| Develop Implications | ✓ | ✓✓ | ✓✓✓✓ |
| Addressing Channel Erosion Hazards | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Addressing Flood Hazards | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Reducing/Offsetting Development's Environmental Footprint | ✓✓ | ✓✓✓ | ✓✓✓✓ |
| Approvability | ✓✓ | ✓✓✓✓ | ✓✓✓✓ |
| Secondary Compliance | - | ✓✓ | ✓✓✓✓ |
| Score and Rank | 9/32 | 25/32 | 32/32 |

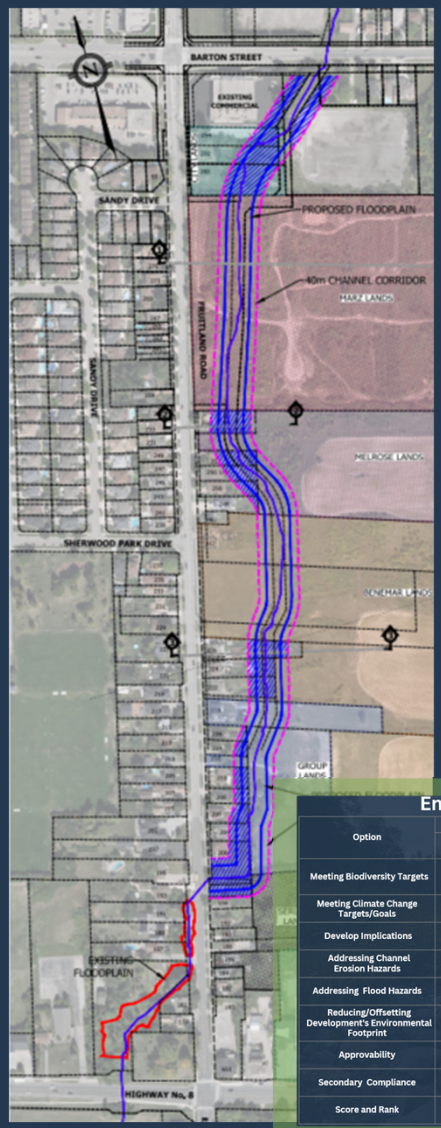



# Option 1: Do Nothing

- Minimal intervention (**<u>does not align</u>** with objectives for biodiversity and climate action plan)
- No major stormwater management improvement
- Least efficient layout with low development compatibility and increased carbon emissions from fill import
- Limits or precludes re-development potential of 19 private properties
- Erosion and flood risks remains to existing properties
- No ecological or geomorphological enhancement
- **<u>Meets</u>** agency requirements for flood and erosion hazards
- **<u>Does not meet</u>** requirements of SCUBE

**Environmental Assessment Table**

| Option | 1<br>Do nothing, leave watercourse and floodplain in place | 2<br>Improve the watercourse in its existing location | 3<br>Channel Realignment |
|---|---|---|---|
| Meeting Biodiversity Targets | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Meeting Climate Change Targets/Goals | ✓ | ✓✓ | ✓✓✓✓ |
| Develop Implications | ✓ | ✓✓ | ✓✓✓✓ |
| Addressing Channel Erosion Hazards | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Addressing Flood Hazards | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Reducing/Offsetting Development's Environmental Footprint | ✓✓ | ✓✓✓ | ✓✓✓✓ |
| Approvability | ✓✓ | ✓✓✓✓ | ✓✓✓✓ |
| Secondary Compliance | - | ✓✓ | ✓✓✓✓ |
| Score and Rank | 9/32 | 25/32 | 32/32 |

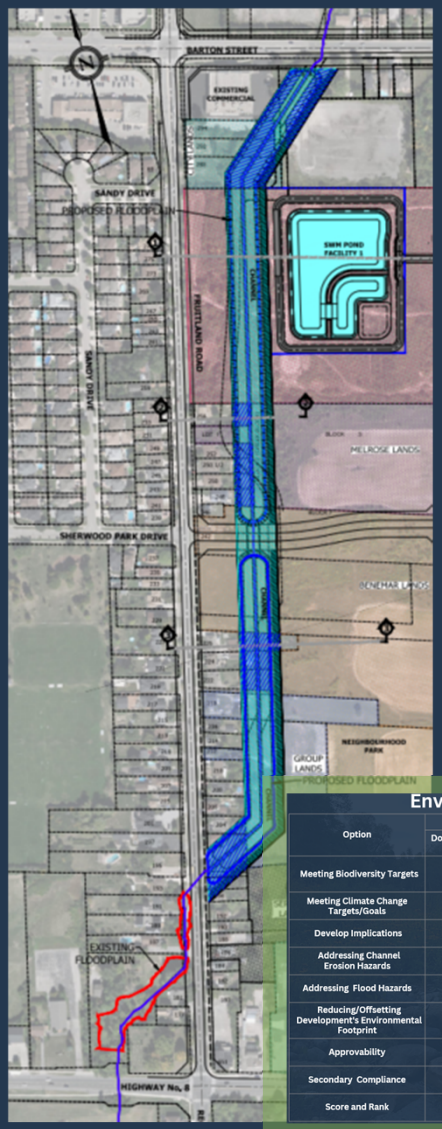



# Option 2: Improve in Existing Location

- Enhances natural habitats (**aligns with biodiversity and clime action plans**)
- Improves stormwater management
- Moderately efficient development layout
- Increased carbon emissions from fill importation
- Limits or precludes re-development potential of 12 existing private properties
- Reduces flood and erosion risk to existing property, allows natural meandering
- Enhancements to ecological and geomorphological features
- **Meets** agency requirements for flood and erosion hazards
- **Meets** requirements of SCUBE

**Environmental Assessment Table**

| Option | 1<br>Do nothing, leave watercourse and floodplain in place | 2<br>Improve the watercourse in its existing location | 3<br>Channel Realignment |
|---|---|---|---|
| Meeting Biodiversity Targets | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Meeting Climate Change Targets/Goals | ✓ | ✓✓ | ✓✓✓✓ |
| Develop Implications | ✓ | ✓✓ | ✓✓✓✓ |
| Addressing Channel Erosion Hazards | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Addressing Flood Hazards | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Reducing/Offsetting Development's Environmental Footprint | ✓✓ | ✓✓✓ | ✓✓✓✓ |
| Approvability | ✓✓ | ✓✓✓✓ | ✓✓✓✓ |
| Secondary Compliance | - | ✓✓ | ✓✓✓✓ |
| Score and Rank | 9/32 | 25/32 | 32/32 |




# Option 3: Channel Re-Alignment

- Enhances natural habitats **(aligns with biodiversity and climate action plans)**
- Improves stormwater management
- Most efficient development layout, reduced carbon emissions by limiting fill import
- Limits or precludes re-development potential for 4 existing private properties
- Reduces flood and erosion risk to existing property, allows natural meandering
- Enhancements to ecological and geomorphological features
- **Meets** agency requirements for flood and erosion hazards
- **Meets** requirements of SCUBE

**Environmental Assessment Table**

| Option | 1<br>Do nothing, leave watercourse and floodplain in place | 2<br>Improve the watercourse in its existing location | 3<br>Channel Realignment |
|---|---|---|---|
| Meeting Biodiversity Targets | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Meeting Climate Change Targets/Goals | ✓ | ✓✓ | ✓✓✓✓ |
| Develop Implications | ✓ | ✓✓ | ✓✓✓✓ |
| Addressing Channel Erosion Hazards | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Addressing Flood Hazards | ✓ | ✓✓✓✓ | ✓✓✓✓ |
| Reducing/Offsetting Development's Environmental Footprint | ✓✓ | ✓✓✓ | ✓✓✓✓ |
| Approvability | ✓✓ | ✓✓✓✓ | ✓✓✓✓ |
| Secondary Compliance | - | ✓✓ | ✓✓✓✓ |
| Score and Rank | 9/32 | 25/32 | 32/32 |

# Supporting the *Five-Year Biodiversity Action Plan for Hamilton, 2024*

## Key Priority 3: Long-term Protections and Connections

- Channel corridor allows for safe animal passage with connection to upstream and downstream habitats
- Road crossing will be sized to provide adequate passage for medium sized mammals
- Remove fish barriers to allow for access to more habitat


# Supporting the *Five-Year Biodiversity Action Plan for Hamilton, 2024*

## Key Priority 6: Aquatic Habitat Restoration and Enhancement

- improves habitat conditions and remove existing debris
- Removes barriers for fish passage and provides habitat for fish life cycle
- Natural floodplain with wetland features can provide water quality and improve infiltration
- Reduce flooding to new and existing properties by containing flood flows
- Erosion risk is contained and allows channel to naturally migrate without risk to property

## Comparison of Watercourse 5 Alignment Options

Block 1 Servicing Strategy -Fruitland Winona Secondary Plan

| OPTION 1 - DO NOTHING | Total (ha) |
|---|---|
| Low Density Residential 3 | 2.86 |
| Low Density Residential 3 | 1.08 |
| **Total LDR3** | **3.94** |
| Low Density Residential 2 | 0.87 |
| Low Density Residential 2 | 1.4 |
| **Total LDR2** | **2.27** |
| Arterial Commercial | **0.65** |
| | |
| **TOTAL (Floodplain and Watercourse 15m buffer*)** | **6.86** |

| OPTION 2 - IMPROVE IN PLACE | Total (ha) |
|---|---|
| Low Density Residential 3 | 1.75 |
| Low Density Residential 3 | 0.68 |
| **Total LDR3** | **2.43** |
| Low Density Residential 2 | 0.81 |
| Low Density Residential 2 | 0.00 |
| **Total LDR2** | **0.81** |
| Arterial Commercial | 0.31 |
| | |
| **TOTAL (Re-Channelized - Existing location)** | **3.55** |

| OPTION 3 - RE-CHANNELIZE | Total (ha) |
|---|---|
| Low Density Residential 3 | 1.62 |
| Low Density Residential 3 | 0.51 |
| **Total LDR3** | **2.13** |
| Low Density Residential 2 | 0.06 |
| Low Density Residential 2 | 0.91 |
| **Total LDR2** | **0.97** |
| Arterial Commercial | 0.29 |
| | |
| **TOTAL (Re-Channelized - New location)** | **3.39** |

Note: Areas are approximate only.

*Option 1 assumed a 10m watercourse channel with a 15m buffer on either side, similar to the 40m total channel in the re-channelized options.

**Development Density Implications**

Option 1 - Significant land absorption of efficient land development , would trigger OPA, Rezoning and density compensation will trigger need for increased density development to midrise/high rise development

Option 2 - Less significant land absorption of efficient land development would trigger OPA, Rezoning and density compensation for increased density development.

Option 3 - Most efficient land development plan

# Watercourse 5-Comparison of Options 1, 2 &3

Barton Street
Fruitland Road
Fruitland Square
Sandy Drive
Valera Drive
Sherwood Park Drive
Sherwood Park Road
Private Road
Barton Street
Fruitland Road

## Legend

- Watercourse
- Option 1
- Option 3
- Option 2
- Property
- Floodplain

### Secondary Plan Land Use

- Arterial Commercial
- Community Park
- District Commercial
- General Open Space
- Institutional
- Local Commercial
- Low Density Res 2
- Low Density Res 2b
- Low Density Res 3
- Medium Density Res 2
- Natural Open Space
- Neighbourhood Park
- Utility
- Other

N
W
E
S

0 0.03 0.06 0.11 0.17 0.22 Kilometers

THIS INTERIM EXISTING FLOODPLAIN WILL CONSTRAIN DEVEOPMENT BOTH SIDES

THIS EXISTING FLOODPLAIN TO BE ELIMINATED DUE TO NATURAL CHANNEL DOWNSTREAM

ALL PERMANENT IMPROVEMENTS WILL CONTAIN THE THE FLOODLINES BY SHIFTING THE PURPLE LINE INTO THE GREEN OR RED CORRIDORS

PERMENANT IMPROVEMENTS ARE 80% OF THE ENTIRE WATERCOUSRE FROM BARTON TO FRUITLAND. PERHAPS 1 HCA PERMIT.

840 m

690 m

EXISTING FLOODPLAIN

PROPOSED FLOODPLAIN

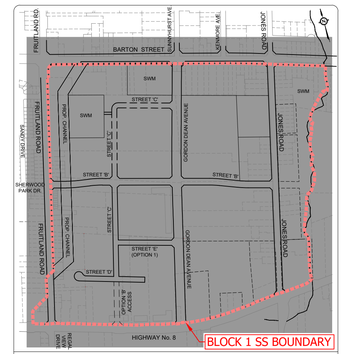
PROPOSED LOW FLOW

PERMANENT NATURAL CHANNEL DESIGN

EXISTING CREEK BLENDED IN TO ENGINEERED CHANNEL

THIS IS A PERMANENT IMPROVEMENT.

INTERIM-DO NOTHING UNTIL LANDS DEVELOP OR PIPE




**KEY PLAN**
N.T.S.

## LEGEND

- LIMIT OF PROPERTY
- EXISTING CONTOUR & ELEVATION
- PROPOSED TEMPORARY DICB
- 90.50 PROPOSED ELEVATION
- 90.50SW PROPOSED SWALE ELEVATION
- (90.50) FUTURE ELEVATION
- 90.87 EXISTING ELEVATION
- MAXIMUM 3:1 (UNLESS OTHERWISE NOTED)
- PROPOSED OVERLAND FLOW ROUTE
- EXISTING OVERLAND FLOW ROUTE
- DENOTES AREA OF COMPLETE CHANNEL RECONSTRUCTION
- DENOTES AREA OF FUTURE STUDY. GRADING NOT CONTEMPLATED AT THIS TIME.

**BENCHMARK**

MONUMENT # 07720020001
ROUND IRON BAR WITH BRASS CAP LOCATED IN STONEY CREEK 9m NORTH OF CENTRELINE OF BARTON STREET 5m WEST OF CENTRELINE OF SUNNYHURST AVENUE AND 4m EAST OF CENTRELINE OF DRIVEWAY TO HOUSE No. 713.
ELEVATION: 87.489m CGVD-1928:1978.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# FRUITLAND WINONA BLOCK 1
## CITY OF HAMILTON

PERMENANT W5C IMPROVEMENTS

RESPECTING PRESERVATION OF THE EXISTING CREEK IN LANDS NOT CONTROLLED BY THE DEVELOPER GROUP

| PROJECT No. | DATE | SCALE | DWG No. |
|---|---|---|---|
| 20-263 | APR. 2024 | 1:2500 | **GRD-1** |

F:\PROJECTS\20-263 (BLOCK) BSS • HAMILTON\DRAWINGS\200 • GRADING\GRD-1_GRADING PLAN.DWG